

Eniwetok

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
DI-6

APPROVED DECEMBER 1941

K-1B

II



Bill

110 2

Daily tide predictions for Bikini Atoll are readily obtained by applying the following differences for Jaluit as published on page 10, subject tide tables:

- Time of high and low waters . . . . . Subtract 10 minutes
- Height of high water . . . . . Add 0.1 foot
- Height of low water . . . . . Add 0.2 foot

The predictions for Bikini Atoll thus obtained will be for the time meridian 180 deg. W.

5 sq. = 1-inch

Kennedy 1-B2

757'9" - 768'3" - 4 miles across the southern



Daily tide  
the following are  
tables:

Time of high

Height of

Height of

the predicted  
180 deg. W.

5 sq. = 1-inch

## Kennedy 1-B2

757'9" - 768'3" - Fairly coarse tan calcareous  
coral + moll. (mainly gast.)  
- some fragments of fairly  
large shells; some brown  
Murchisonia. Drilled soft  
but with little chatter in  
upper part. Wood shown  
getting finer - better recovery  
of cuttings.

768'3" - 778'9" - Drilled soft, yielding very  
much cuttings, washed 2  
gallons mud to get fraction  
of teaspoon of fine sand with  
some discoid forams. Small  
sample coarse cuttings may  
be mainly from previous run.

778'9" - 789'3" - Drilled soft except for two  
brief periods of chatter.  
Cuttings slow in returning -  
tan coral few small moll.  
- took bag of mud for fine



789'3" - 799'9" - Drilled easy, no chatter but  
cuttings coarser & more  
numerous - tan coral &  
moll with numerous brown  
Margaritopsis

799'9" - 810'3" - many fragments of wood -  
drills very easy - light tan  
coral ls. many gastropods, forams,  
bits of mollusk shells

810'3" - 820'9" - many wood slivers -

820'9" - 831'3"

831'3" - 841'9"

Drills in 5-10 min  
mud sample



841'9" - 852'3"

drilled in 10 min.

852'3" - 862'9"

862'9" - 873'3"

873'3" - 883'9"

883'9" - 894'3" - very fine - took mud sample

894'3" - 904'9" -

very high speed  
drilling



904'9"-915'3"

X

915'3"-925'9"

X

925'9"-936'3"

X

936'3"-946'9"

X

946'9"-957'3"

X

957'3"-967'9" -

X



967'9" - 977'8"

977'8" - 988'2" -

988'2" - 998'1"

998'1" - 1008'7"

1008'7" - 1018'6"

1018'6" - 1029'00"



1029' 0" - 1038' 11"

2-samples -

1) Market FINE taken  
by holding cheesecloth sack  
to catch cutting directly then  
running water into sack to  
rins out mud. Cuttings  
varicolored (tan, white, cream)  
very fine fragments appear  
as a fine well-graded sand.  
Larger fragments I have sharp  
angular edges & seem hard. These  
larger fragments may be  
contamination due to recirculation  
of mud containing cuttings  
from a harder, shallower zone.  
Organics include molluscs,  
corals, rare forams.  
2) regular sample

0800 Pit 26.4 Hole 27.6 Air 27.2

Jan 1<sup>st</sup> 12 M. M. Russell starts shift.

Dames & Moore <sup>and rotated</sup> core was just  
being put down hole at Noon.  
Core driven about 20 inches and  
brought to surface at 2.45.

13  
14 → 1038' 11" - 1040' 7" Dames & Moore  
core - recovery - 20 inches or 100%



- recovery. Core put in box may be considered in 3 parts.
- 1) Topmost 8 inches, labelled M.D. in core box. This was caught in core barrel above the regular core chamber, in that portion designed for mud and cuttings to pass out. It is probably all or nearly all drilling mud although probably grading into valid sampled material toward bottom end of this portion.
  - 2) Portion of core retained in coring chamber. This is intact for all of its 10+ inches, although a ~~small~~ small piece chipped out (replaced) ~~for~~ 4 inches from top. This portion is marked CORE in box.
  - 3) Cutter. Bottom 2 inches of this core was retained in cutting end of barrel. It is intact though not so perfectly as core.

Note. Daniels & Moore cores, when good, were too large for core box & necessitated having plywood gasket for box.

Sample appears to be



Hill

no. 2

1038  
20  
918

998

1038  
180  
858

a mixture of sand & silt. The material is quite fine possibly explaining poor cutting samples of from same depths. color when wet was steel gray whether



8  
a mixture of sand & silt. The material is quite fine, possibly explaining poor cutting samples of from same depths. color when wet was steel gray, whether this is natural color or coating of drilling mud awaits closer examination.

Thick discoid forams, with eroded periphery, also wheel-shaped foram (miliolid?).

\* as the last 180 feet of pipe (~~was~~) were being lowered to resume drilling after closing the hole "bridged" 3 times \*  
858' making it necessary for  
918' the driller to "break the bridge"  
998' by starting circulation at each bridge.  
180 ft 120 ft 40 ft  
from bottom (1038')

A check of rods that went down with the bit is as follows.

- |                               |          |
|-------------------------------|----------|
| 1) 5 $\frac{7}{8}$ inch bit = | 1' 9"    |
| 2) 89 rods at 10' 6" each, =  | 934' 6"  |
| 3) 5 rods at 20' 6" each      | 102' 6"  |
|                               | 1038' 9" |

Thus bone field drilling resumed



at 1038'9 and first sample  
run. after coring was from  
this depth 1038'9" to end of Kelly  
(10'4") or 1049'1"  
1040'5"

1038'9 - 1049'1 (next range  
1039'1 - 1049'7)

(X)  
Cuttings of various size.  
Texture, color and content. Clumps  
of mud which defied washing.  
(Mud mixer clogged at one  
point earlier in the day and  
considerable amounts of equipment  
were thrown into pit without  
adequate mixing with water).  
Wood (from plug after cementing)  
Cement (see above) and rubber (from  
plug). Molluscs both shells &  
molds, white & tan. Corals  
same condition. Rare forams  
white & tan. Sample looks  
as though some of every previous  
sample had been mixed to  
make this one -- which is  
probably exactly what happened  
in the hole. Driller reports  
a "hard" layer about 1 foot  
thick at 1045-1046. E



1049'1" - 1059'7"

Cuttings more uniformly  
tan than last though  
by no means completely so.  
Many mollusc shells, molds,  
coral fragments, fibrous  
perous algae (P), Clear calcite.  
XLS (dog tooth spar)

1059'7" - 1070'1"

Uniformly tan, coral &  
molluscs - mostly coral.  
Gastropods, zebra sods.  
Still getting wood. Echinoid  
spine. Some extra fines  
mixed with sample by catching  
mud in bag & washing.  
Fines have numerous  
smaller foraminifera

1070'1" - 1080'7"

1070'1" - 1080'7"

Molluscs - coral. Uniform tan  
rare white shell frags (contam  
ination?). Many pieces of  
mollusc shells indicating  
large specimens as well as  
many small perfect ones.



Operculum of Turbo, Corals  
showing internal structure  
almost to the exclusion  
of external surface.  
Chuck rattled toward end  
of run. Shallow-water Bulla

1080' 7" - 1091' 1"

Uniform tan, many high  
spired gastropods, mollusks  
corals about equal. rare  
white Halimeda.

Extra fines in glass vial.  
Some smaller foraminifera.

LADD 4/14 - mid. to noon

1091' 1" - 1101' 7" Drilled easily but  
cuttings coarse & heavy -  
caused from higher in hole?  
Most of cuttings are angular  
fragments of tan ls. with  
microscopic organic structure  
too fine to identify with  
low power; some moll.  
molds; some shell frag.  
rare white Margamopora  
Corals not conspicuous.

1101' 7" - 1112' 1" - Drilled harder last two  
ft.; cuttings heavy and



contain balls of mud even after  
vigorous washing - this may be  
well-muddled material from  
walls. As this red was  
drilled down pump stopped  
for lack of gas - tools stuck  
but were freed without much  
difficulty. Cutting essentially  
same as last.

Lower Miocene

→ 1112' 1" - 1122' 7" - Tan ls. with larger  
forams - see samples in vial  
- lower Miocene - rare *Holanda*  
(from above?)

→ 1122' 7" - 1133' 1" - Drilled softer - Tan  
ls. rich in larger forams -  
similar to last

1133' 1" - 1143' 7" - Drilled "very soft" - 1 or 2  
rattles - cuttings appear  
finer & were less abundant  
Tan forams ls. with few small  
molds & fragments of shells



1143'7" - 1154'1" - small stream water  
being added to counteract  
moderate loss of mud, last  
4' of this interval slightly  
harder. Tan forams are  
similar to last; rare  
white Marginopora (from  
above?)

1154'1" - 1164'7" - Mostly soft but with  
hard streaks - tan ls.  
but with larger forams  
much less abundant

1164'7" - 1175'1" - Tan ls. with microscopic  
organic structure that appears  
obscure in artificial light. No  
larger forams seen but brown  
Textularia (few) + white  
Marginopora (rare) noted  
ls. appears recrystallized



1175' 1" - 1185' 7" - Few hard streaks near  
top and near bottom, rest  
very soft drilling. Cuttings  
similar to last but finer;  
note yellow cement core.

1185' 7" - 1196' 1" Drilled like last and  
cuttings also are similar. Larger  
forams rare.

1196' 1" - 1206' 7" - Very soft, no hard streaks.  
Tan cuttings with few good  
moll. & worm forams (brown  
mussel).  
Had a good sample of  
cuttings - probably missed  
main batch.

8:10 A.M. - started out of hole to summer  
stratigraphy

- Encounter bridge 331' off bottom 297'  
Barber bridge at 860'



14 January Noon to Midnight  
Carl Alexis

Put cuttings K-1 0-295'6" in  
powdered milk carton

started drilling about 12:30

18 21' lengths + 1 21' (stabilizer) on  
deck - took sample off bit 1206'7"

1206'7" - 1217'1" -

X

1217'1" - 1227'7" - tan fragments of coral, mollusks,  
some forams, took sample of  
fines, drills easy

1227'7" - 1238'1"

hit hard layer at 1230'  
lost circulation about same depth  
tan fragments of coral, mollusks,  
some forams

1238'1" - 1248'7"

drills hard - "hardest streak on  
any coral island" Mickle  
appreciable amounts of white  
& light tan ls. fragments,  
forams, mollusks  
"losing a lot of mud - must be a  
porous formation" Mickle



1248' 7" - 1259' 1"

drills very hard 50 minutes  
white & light tan lms -  
fragments of coral, Halimeda  
several species forams, some  
light colored pieces ~~do not show~~  
~~organic origin~~ (hard crystalline  
limestone - few small pores -

1259' 1" - 1269' 7"

struck softer layer 6'-7' thick -  
lost circulation

6" pipe has turned - probably  
broken off near top of hole -  
turned back easily with  
bar - prob. worn then by  
drill pipe. Pulled rods  
up inside 6" casing  
shut down for night

Jan. 15 ~ Mon

Mixed up 5,400 lbs. of Flyash  
(suck) - 3 boxes of 24 sacks @ 75 lb.  
+ pumped into drill hole with  
bit at bottom of 6" pipe (i.e.  
535') - earlier test had shown  
mat. would sink in hole & that  
we were connected with some cavity.  
Started pumping at 12:35 PM

in 1500 gal. water +



Finished pumping first batch about 1:30 PM. Jan 15 & immediately mixed another of similar proportions. Pumped entire batch in but failed to plug hole. Driller (P. H. H.) noted that the fluid within the hole neither rose nor dropped much below tide level and from this deduced that mud being pumped into hole is being washed away as fast as it is pumped in by underground circulation, in some way connected with the ocean.

The total amount of Wash used in both batches was 12,500 pounds (5,400 in first 7,100 in second). Efforts to seal cavity by this means abandoned at 4:11.

6:30 PM. Hole not touched for  $2\frac{1}{2}$  hrs. Some pipe was pulled and run on pipe showed surface of drilling fluid to be at least 54 feet from surface. 10 2'6" (5 of long singles) feet altogether removed and more fly ash pumped in. Hole seemed to hold fluid better but



still receded to tide level  
in a few minutes.

- hole shut down until 1/20  
during search for casing &  
pending arrival of mud by air lift.  
Old 4" casing on Parry Id. is  
so pitted & rusted as to be worthless  
except for few lengths. Total of mud  
4" only about 500'. No more  
mud so no stage reaction which  
preliminary plan to drill hole  
on Parry during March or discussed.

Approx. 4 tons Aquagel arrived  
by air lift 1/19 & used by 1/20. Meanwhile an attempt  
is made to pull 6" casing. Up to  
about 6 hours of pulling & hammering  
string is raised 40" (casing  
not broken or previously supported  
- top length or two had turned). Abandoned  
attempt to pull 6" & left string  
in hole until morning - at 535.

Jan 21 - Sunday

Ran down hole to 945 without  
encountering any bridge; start circulation,  
water & fly ash returning and hole  
absorbing mud. Down to 1257'  
& failed to get circulation lock;  
shut down to mix aquagel  
current (3 1/2 - 5 lbs. Aquagel)



to 100 lbs cement + 8 1/2 yds water  
Drilled down 6 1/2 feet, lost 2 feet  
very fast.

Add one rod (10' 6") - drilled  
mostly soft with few hard streaks  
that caused chatter. Poured  
15-18 yds. aquagel cement at  
bottom; pulled up 252' +  
poured 2 loads more (6 yds. +)  
Worked up, pulled bit into 6"  
casing (5-35') + shut down for  
night.

Jan. 22 - Mon.

Pulled all rods out of hole  
and measured all with tape  
- see sheet attached to Drilling  
Report. Into hole following  
yesterday's cement job - tried for  
to obtain circulation with  
clear water at 515' + 831' - with  
est. 45% loss in each case  
(why so low at 515 - inside 6"  
casing?). On to 1270 + lost  
all circulation. Pumped in  
thick mud + sand, regained  
half (or less) water circulation for  
time but mud + sand never  
came back. Drilled to 1279  
8 1/2" at which point hole was

→



in cement. Pulled up into 6" casing + shut down to build a 4" liner.

Jan. 23 - Tues

assembling 4" pipe for liner to extend from bottom to inside 6" casing

Jan. 24 ~ Wed - to 7AM Jan. 25<sup>th</sup>

Ran in 769'8" of 4" casing (see attached sheets). String stuck about 26" above bottom; by pulling + working, got it down to within 7(?)' bottom - i.e. to about 1272'; pulled out, back with bit, built up 500 lb. pressure - out at bottom - to be absorbed at higher levels.

Jan 25 ~ Thurs. (cont.)

Out of hole to remove bit; back to pick up 4", on down to within 1 foot or less of bottom; pull off bottom with difficulty; decided not to try further manipulation for fear of breaking old casing.

Pulled out of hole - away from 4" - rods measuring 500'  $2\frac{3}{4}$ " + bottom of casing



therefore at 1271' 6  $\frac{3}{4}$ " ( $3\frac{1}{2}$ '  
below main cavity.) Pumped  
in 6 gals cement - pressure  
built up to 300 lbs & mud  
came back in full volume.  
An hour later removed rods  
to clean cement, pumping  
in 1800 gals water to  
counteract suction of pressure  
- no return of circulation but  
3 hrs. later water still stood  
40' below ground

Jan 26 - Fri

Water in casing at 20' ± - may  
indicate a seal but more probably  
it merely indicates that the  
column of fluid in the pipe  
is of higher gravity than that outside.  
Into hole with bit at noon  
- bit cement at 320' - drilled out  
in cement to 390' - void area  
where circulation was lost - at  
522' (below packer) back in  
cement; drilled to 630' in cement  
with no return of circulation - evidently  
being lost thru packer (probably  
made useless by pulling pipe up  
& down.



fill

no. 2

$$\begin{array}{r} 13' 6'' \\ 25 \times 20 \ 6\frac{1}{2} = 500 + 13' 6'' \\ 6 \times 21 = 126 \\ \hline 639' 6'' \end{array}$$

In with  $5\frac{7}{8}$  bit to clean cement  
out of 6" casing. Make run



In with  $5\frac{7}{8}$  bit to clean cement out of 6" casing. Make new packer cutting 1' length of 6" down to 5". Started packer in hole in early evening

Jan 27 ~ Saturday

Seated packer at 6:30 AM. Inlet hole with  $3\frac{3}{8}$  inch bit: struck cement at 639' 6"

639' 6"  
21

660' 6"  
21

681' 6"

9:40/A

21

702' 6"

10:05/A

21'

723' 6"

-losing little water - through small cavity (?)

10:25/A

21'

744' 6"

10:45/A

21

765' 6"

11:05/A

21

786' 6"

11:25/A

21

807' 6"

losing little water



1102

11 45

807 6

21

328' 6"

losing little more



11 <sup>45</sup>/<sub>A</sub>      807' 6"  
                  21  
 12 <sup>35</sup>/<sub>P</sub>      828' 6"  
                  21  
 1/P        849' 6"  
                  21  
                  870' 6"

losing little water

~~~ 11:15  
 - losing little water  
 adding more from truck  
 - losing little water  
 12:30/P - shut down & repaired  
 pump - loose wrist pin  
 Washed out 3:50 PM

4/P :      21  
             891' 6"

- 4:40 shot down to repair  
 pump - 1 double & single  
 on ground - another double  
 pulled out

2  
 6:00

6:00 - Replaced gas  
 motor-driven pump  
 with Gardner - Denver  
 air driven pump. Gaskets  
 on this pump leaked  
 & had to be replaced.  
 dug out sediment pit

Jan 28 - Sunday Mid to Noon

0000-0345

Repaired & assembled original  
 pump -



Hill

No 2

11:30  
6  
11:20  
11:10  
11:00  
10:50  
10:40

0400

33 ml.

length

5 side of  
drilling platform

Jan. 28 - Sunday - Mid to Noon Cont.

0350

Dbl. length marked red X  
into hole



35 abt.  
length  
5 in. of  
solid platform

Jan. 28 - Sunday - Mid to Noon Cont.

0350 Dbl. length marked red X  
into hole

0352 Dbl. length into hole  
Hit cement

891' 6"

0355

21  
912' 6"

losing a little water

0418

21  
933' 6"

0438

21  
954' 6"

0458

21  
975' 6"

adding a little water  
to mud pit -

0520

21  
996' 6"

0538

21  
1017' 6"

0603

21  
1038' 6"

0623

21  
1059' 6"

0644

21  
1070' 6"

← stopped adding water  
to mud pit

0703

21  
1091' 6"

← started adding water to  
mud pit

0725

21  
1112' 6"



11

0810  

$$\begin{array}{r} 1112 \text{ } 6 \\ 21 \\ \hline 1133' \text{ } 6'' \end{array}$$

0837  

$$\begin{array}{r} 21 \\ \hline 1154' \text{ } 6'' \end{array}$$

0858  

$$\begin{array}{r} 21 \\ \hline 1175' \text{ } 6'' \end{array}$$

0915  

$$\begin{array}{r} 21 \\ \hline 1196' \text{ } 6'' \end{array}$$

16 0930  

$$\begin{array}{r} 21 \\ \hline 1217' \text{ } 6'' \end{array}$$

17 0955  

$$\begin{array}{r} 21 \\ \hline 1238 \text{ } 6'' \end{array}$$

18 1010  

$$\begin{array}{r} 21 \\ \hline 1259 \text{ } 6'' \end{array}$$

$$\begin{array}{r} 21 \\ \hline 1280 \text{ } 6'' \end{array} \leftarrow \text{T.D.}$$

more than  
 Lost  $\frac{1}{2}$  of circulation  
 between 1249' 0" & 1259' 6"

1259' 6" - 1270' 0" Started circulating  
 mud (aquagel) &

We may have drilled thru  
 the cement - We did -  
 Complete loss of circulation  
 at 1259' 6"

1058

RIP

C. C. Lee











# Geologists on K 1 B

| 9   |     | Mid to Noon | Noon to Mid |
|-----|-----|-------------|-------------|
| Jan | Tue |             | Alexis      |
| 10  | Wed | Russell     | Alexis      |
| 11  | Thu | Russell     | —           |
| 12  | Fri | —           | Ladd        |
| 13  | Sat | Alexis      | Russell     |
| 14  | Sun | Ladd        | Alexis      |
| 15  | Mon | Russell     | Ladd        |



